Dianne Byrne
Component Leader, Risk/Health
U.S.EPA

"Health issues are keys to air quality management and the risk study of Volgograd is an important step. Follow-up on the issue will be critical to the sustainability of RAMP."

RISK/HEALTH

BACKGROUND

The risk assessment portion of the RAMP was intended to estimate the health impact of emissions from Volgograd enterprises on the local population. Risk assessments rely on air quality data obtained either by measurements (i.e., monitoring data) or by estimates that are developed by applying dispersion models to emissions data. Air quality data are combined with health effect information, population census data, and exposure assumptions to project the likelihood of particular health effects occurring among the population living near emission sources. This component of RAMP was designed to build upon the results of other efforts such as source testing and emissions inventory (for emissions data), ambient monitoring, and strategy development.

A baseline risk assessment was planned for Volgograd to estimate the status quo health impacts (i.e., before the application of strategies such as low cost measures). Subsequent assessments, based on assumptions about applying various emission reduction strategies to particular enterprises, were also planned.

The results of risk assessments were also recognized as useful tools in prioritizing emission reduction strategies. For example, a risk assessment can estimate how many instances of a particular disease or how many potential deaths may result from exposure to a specific pollutant, facility, or part of a facility (e.g., fugitive releases versus stack emissions) compared to other pollutants, facilities, or emission points. Such information can focus emission reduction efforts in the strategy development phase on the pollutants and sources of most concern to public health. Results from such assessments can also be used to quantify the benefits (e.g., number of disease cases prevented or deaths avoided) associated with a particular emission reduction strategy and its costs.

ACCOMPLISHMENTS

During 1993-1995, US EPA and VESA staff worked together to produce the air quality data needed as inputs for the risk assessments. Point source emission inventories for the major enterprises were developed and compiled, and the quality of the data was carefully evaluated. In addition to the emissions data, VESA collected information that could affect the release and dispersion of emissions (e.g., stack height, exit temperature and flow rate). A relevant dispersion model was selected and meteorological data for Volgograd were obtained.

Based on these inputs, the Harvard Institute for International Development (HIID) worked with VESA dispersion modelers in 1996-97, in a separate US AID-sponsored

project, to estimate air quality for both total particulates and several specific hazardous air pollutants. These ambient concentrations were combined with health effect data and local population data to predict population risk for Volgograd residents.

Their risk assessment predicted the number of additional deaths that could occur as a result of exposure to ambient particulate levels from 29 point sources throughout Volgograd. This number ranged from 900 to 2,666 deaths per year in a population of about one million. The range reflects the large uncertainties that are associated with the various assumptions used in the assessment. Such ranges are not unusual, given the lack of actual exposure information (such as the time that residents spend indoors versus outdoors, how many years a person may actually reside in Volgograd, the fluctuations in emission rates over time, etc.) and the uncertainties associated with the underlying health effect data. Over 80% of the estimated deaths were associated with emissions from two enterprises - the aluminum plant and the Red October Steel Mill. Carcinogenic risks from exposure to hazardous air pollutants (toxins) were estimated to be negligible relative to the mortality risks from particulates. Results of the risk assessments were conveyed to local policy makers in Volgograd in March, 1997.

IMPACTS

Following the completion of the risk assessment, an analysis of cost-effective options for reducing emissions and associated health risks was undertaken. The options reflected the control measures developed under the Low Cost Measures component of the program. Mortality risks could be reduced for relatively small costs.

Preliminary results of this cost-effectiveness analysis were presented to local officials in Volgograd and at a risk assessment meeting in Moscow in March 1997. As described in the Low Cost Measures report, a precast delta built to reduce fugitive emissions from electric arc furnaces was installed at the Red October Steel Mill and the aluminum plant adopted a paving and regular water spraying program to reduce secondary particulate emissions. Projections of the reductions in mortality that may be realized as a result of implementing these emission reduction options are not currently available.

DOCUMENTATION

"Adopting Cost-Effective Analysis to Risk Management in Russia. A Case Study of Air Pollution Health Risks in Volgograd," HIID.

Principals in the Risk/Health Component

Emma Bezuglaya, MGO
Dianne Byrne, US EPA
Svetlana Kosenkova, VESA
Larisa Vishnevetskaya, VESA

Willis Beal
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"The response by Volgograd citizens to a more open process and to 'green' issues in general has been gratifying and will help bring wider participation in the future, especially by Volgograd's young people."

PUBLIC PARTICIPATION

BACKGROUND

The public participation component of RAMP was initiated during the second half of the project beginning in May 1995. The initial component plan was modified several times to account for realities of working with the Russian partners. Initial plans called for the formation of a task force to manage a project fund containing subgrant dollars as well as matching funds from local sources. These funds were then to be disbursed on a competitive basis for community-based projects emphasizing active public participation in efforts related to RAMP or air quality issues in general. This plan was subsequently modified in order to accommodate the needs, realities, and time constraints of RAMP implementation.

The Volgograd Citizens Environmental Task Force was formed in the fall of 1995 with twelve representatives from the city administration, non-governmental organizations, businesses, and schools. It was necessary to initiate public participation activities while continuing to work with partners through an open, competitive selection process. Because the Task Force was comprised of a broad representation of public organizations, a sub-agreement with the Task Force to manage a series of public awareness and participation activities was initiated. These initial projects included the following:

- Managing a public and media awareness campaign about environmental issues in Volgograd. Activities included the development of flyers, brochures, and newspaper articles and radio spots on environmental issues, as well as holding a public hearing on pollution issues.

- Developing the Inter-regional Exhibition of Resource Materials - New materials were collected for the traveling exhibition. Permanent branches of the exhibition were established in the northern and southern districts of Volgograd.

- Publishing a directory of Volgograd organizations working on environmental issues - The 40 page directory includes NGOs, governmental offices, schools and university departments as well as private sector organizations involved in environmental matters.

- Organizing of the "Green City Campaign" as a series of tree planting and public information dissemination events held in city parks.

- A "Children's Smoke School" was given for Volgograd students. The classes included general environmental topics focusing on air pollution and visible emissions.

ACCOMPLISHMENTS

"Coalitions were constructed that never before considered each other. The idea of consensus building is a new concept fostered by the public participation program."

Valeria Kotovets
Volgograd, Russia

These activities have achieved the goal of promoting increased awareness of environmental issues by the general public. In addition, a key accomplishment of the participation component was the increased stature and influence of Volgograd NGOs and the development of constructive inter- and intra-sector constructive partnerships. Many of the NGO partners committed to working as part of the RAMP project. Their organizations and their works have been taken more seriously by the city administration as a result. They have also achieved increased access to authorities to get information and to press for their organizational agendas. Moreover, the NGO partners have reported that their work on the Task Force has helped them develop positive working relationships with others from within the NGO community as well as with government and business representatives. In fact, prior to the RAMP project, the individual NGO representatives may have been aware of other groups, but they had never worked together or collaborated. These groups are now better aware of each others' experience, expertise, capabilities and constituencies, and several new collaborative projects outside of the scope of the RAMP project have been developed.

Demonstration of smoke generator for visible emission training at the Children's Atmosphere School in Volgograd.

IMPACTS

An important strength of RAMP was its insistence at the outset of working simultaneously at national and local levels in order to institutionalize project results. The inclusion of public participation activities helped to broaden the effectiveness of the project at the local level, through the establishment of the collaborative relationships discussed previously. An important difficulty, especially for public participation, was the lack of concise, easy-to-read printed information about the overall goals and process of the RAMP component activities. The Russian participation partners waited a very long time to receive these kinds of materials. Additionally, other RAMP component managers were not able to successfully identify opportunities for public participation for their project components. The result was that there was less of an air quality emphasis for public participation activities than originally intended. However, as previously noted, the inclusion of broader environmental issues for public participation has been an important factor in enabling the Task Force to develop concrete activities to work on, resulting in improved organizational relationships.

Valery Azarov, chair of the Volgograd public participation task force

DOCUMENTATION

The Volgograd Citizens Environmental Task Force developed a number of brochures and publications for the general public on a variety of topics, including automobiles and air pollution (5,000 copies), the dangers of mercury pollution, a description of the RAMP project, and a catalog of ecological resource materials. Members of the task force prepared press releases and participated in interviews for nearly 50 newspaper articles and nearly 30 radio and television appearances.

Principals Involved in Public Participation

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Valeria Kotovets, Volgograd Task Force
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